ET: Legacy Development - Feature #198

All new hitbox and bounding box system

10.02.2013 14:56 - Jacker

Status:	New	**% Done:**	50%
Priority:	Normal		
Assignee:			
Category:	Mod generic		
Target version:	2.77		
OS:		**Arch:**	

Description

The current system of hit detection is flawed and outdated in many ways, and as computers have gotten a lot quicker after the cold war the more complex calculation needed for detection is no longer a problem.

I think we should go with the common idea of bounding box which has the hit boxes inside of it.
We can use the animation skeleton to bind hit boxes more accurately to the model.

https://developer.valvesoftware.com/wiki/Hitbox

Related issues:

Related to ET: Legacy Development - Feature # 98: Inspect/add prediction code...	**New**	**03.11.2012**
Related to ET: Legacy Development - Feature # 109: Add ETPro like hitboxes	**Invalid**	**11.11.2012**
Related to ET: Legacy Development - Bug # 503: Fix dead player hitbox directi...	**New**	**01.02.2014**
Related to ET: Legacy Development - Feature # 662: Introduce ragdoll effect	**Invalid**	**22.11.2014**
Related to ET: Legacy Development - Bug # 735: Player model is shaking	**Fixed**	**18.12.2014**
Related to ET: Legacy Development - Feature # 1174: Increase slightly the hei...	**New**	**18.01.2019**
Related to ET: Legacy Development - Bug # 1209: Region hits don't take non he...	**Invalid**	**21.02.2019**

Associated revisions

Revision 4d5f6793 - 27.11.2013 21:38 - Spyhawk

mod: use fixed height hitboxes from etpub, refs #198

Revision f24596c5 - 27.11.2013 21:38 - Spyhawk

game: added g_debugHitboxes CVAR_CHEAT, refs #198

Revision 20cc5ff5 - 11.12.2013 21:42 - Spyhawk

mod: use fixed height hitboxes from etpub, refs #198

Revision 2dea3c0f - 11.12.2013 21:42 - Spyhawk

game: added g_debugHitboxes CVAR_CHEAT, refs #198

Revision c142cba0 - 01.02.2014 23:30 - IR4T4

game: g_debughitboxes fixed

Revision e1b64091 - 02.02.2014 11:02 - IR4T4

game: fixed antilag trace functions to use our proper hitbox values

Revision 2ef0fb06 - 15.12.2014 16:43 - Jacker

included the mdx files for the realhead code on qagame

Revision b501d55d - 15.12.2014 16:47 - Jacker

woops the macros were incorrect

Revision cc81256c - 15.12.2014 17:00 - Jacker

only allow the sv_gettag to use client code on release builds

Revision 5408aba4 - 15.12.2014 23:00 - IR4T4

game: g_realhead added

Revision fa56a80d - 15.12.2014 23:22 - Jacker

mdx fixes

Revision 2969011f - 15.12.2014 23:22 - IR4T4

game: clean up

Revision b3170253 - 16.12.2014 11:39 - Jacker

fixed the build on non mdx configuration

Revision 2b9d4cdc - 16.12.2014 15:41 - Jacker

realhead code now works, but needs testing

Revision eac71cfb - 16.12.2014 16:54 - Jacker

added missing code and uncrustified

Revision 41effd95 - 16.12.2014 16:55 - Jacker

enable mdx support by default

Revision 39d296a3 - 16.12.2014 20:44 - IR4T4

game: server side realistic hitboxes fixed

Revision 23ca303a - 17.12.2014 12:50 - Jacker

fixed the infinite helmet bug, refs #198

Revision 48e59277 - 17.12.2014 14:20 - Jacker

changed the frametime value to be calculated based on sv_fps, refs #198

Revision eb6b0b62 - 17.12.2014 19:59 - IR4T4

game: added Neil Toronto's skip correction code

Revision 3ec570f3 - 18.12.2014 17:44 - IR4T4

game: fix warnings refs #735

Revision 299c89d0 - 21.12.2014 17:20 - Jacker

enabled realhead also for proning players

Revision d6da69e1 - 21.01.2015 13:41 - Spyhawk

cgame: added comment about CG_RailTrail time value, refs #198

History

#1 - 11.05.2013 12:15 - Dragonji

I think it is not a good idea to add such accurate hitboxes to W:ET. People who play the game for years are used to the big boxes they played with for

the whole time.

Jaymod and N!tmod for example have options to use such hitboxes:

  9445010600_1368266722.jpg

And they are a complete fail in my opinion, almost none server use them because as I said previously people are used to the ones they played with for years, the accurate ones completely change gameplay as players become unhittable. The other thing is that mid server can become a lag fest with such hitboxes even if running on Core i7 machine...

I'd only like to suggest to just slightly adjust original/ETPro hitboxes, what I' thinking about is something like this:

  9863735000_1368266180.png

Bodybox ending at the shoulders level instead of the top of the head, it is a big change already but worth implementing in my opinion so:
1. Players won't become unhittable
2. Players won't be "granted" with bodyshots while shooting at the head level anymore.

#2 - 11.05.2013 12:46 - Mateos

It is supposed to be an option isn't it?

N!tmod is quite popular, even if the hitboxes are tinier. As well, there's people who likes it, people doesn't.

Not sure about setting the majority on a side or the other one Personally I see it as a extra challenge, be more accurate. At least you know that you hit what you shoot with such new hitboxes, while laggers can hit anything with the etmain one, even if they shoot totally left of right

#3 - 11.05.2013 12:59 - Dragonji

Mateos wrote:

> N!tmod is quite popular, even if the hitboxes are tinier. As well, there's people who likes it, people doesn't.

N!tmod by default uses the same big boxes as other mods and ETPro, the picture I posted is just an option which can be enabled but doesn't have to. I know only 1 server which uses realistic N!tmod hitboxes and it is the server of N!tmod devs.

#4 - 11.05.2013 13:24 - Spyhawk

Dragonji wrote:

> Mateos wrote:

N!tmod is quite popular, even if the hitboxes are tinier. As well, there's people who likes it, people doesn't.

N!tmod by default uses the same big boxes as other mods and ETPro, the picture I posted is just an option which can be enabled but doesn't have to. I know only 1 server which uses realistic N!tmod hitboxes and it is the server of N!tmod devs.

You can't make everybody happy, so make this a cvar. A more modern, accurate hitbox system is definitely welcome, especially if the mod wants to become active on the pro-scene. Lag compensation will do the rest.

#5 - 11.05.2013 14:54 - Dragonji

Spyhawk wrote:

Lag compensation will do the rest.

Well I don't think so, as some mods use Neil Toronto's Unlagged code and it still feels like players were unhittable with smaller hitboxes. The problem with this is spread, if you decide to make hitboxes much smaller, you should also decrease spread of weapons.

EDIT:
Damn, I mean spread of course, not recoil.

#6 - 11.05.2013 17:39 - Saukko

I have always been against the ETPro hitboxes and I still won't change my mind. Those hitboxes are the worst hitboxes with Jaymod. I think Jaymod might have new hitboxes but still has that awful hit detection as usually. When there is a standing player on ETPro and you shoot almost a meter to left or right you will still hit the enemy. So yeah I would rather be with the idea to make a CVAR out of this. Make one for accurate hitboxes and for the hitboxes like ETPro's (bähhh).

-*S

#7 - 11.05.2013 18:20 - Dragonji

All of the mods has got same hitboxes as ETPro by default (at least if talking about size), an only exception is NQ where bodybox doesn't cover head

But yeah, why not to make tiny boxes as a cvar, I just think it is a waste of time, I doubt anyone will ever use such realistic CS-like ones.

#8 - 11.05.2013 22:33 - Jacker

Just to point out that a big part of the hitbox system update is that the hitboxes would actually use the bone data, now the hitboxes are pretty much hard coded. Any one with a brain can see that its never a good idea to have hard coded vertex data when it should be read in and calculated properly per model and animation. When we move into a new model format that will be one thing i will be looking at.

#9 - 12.05.2013 18:45 - Dragonji

Jacker wrote:

> Just to point out that a big part of the hitbox system update is that the hitboxes would actually use the bone data, now the hitboxes are pretty much hard coded. Any one with a brain can see that its never a good idea to have hard coded vertex data when it should be read in and calculated properly per model and animation. When we move into a new model format that will be one thing i will be looking at.

That's what N!tmod does AFAIK.

Anyway, I hope it will be cvar-controlled.

#10 - 12.05.2013 23:19 - Dragonji

Jacker wrote:

> The current system of hit detection is flawed and outdated in many ways, and as computers have gotten a lot quicker after the cold war the more complex calculation needed for detection is no longer a problem.
>
> I think we should go with the common idea of bounding box which has the hit boxes inside of it.
> We can use the animation skeleton to bind hit boxes more accurately to the model.
>
> https://developer.valvesoftware.com/wiki/Hitbox

If you want such tiny hitboxes, that's absolutely fine. But you need to redefine the spread in the guns otherwise the game will be totally different from the one we used to play for 10 years.

The thing with CS is it's a slow game, strategic, and the game can be mastered with the aiming. In ET type game I don't think there is any place for extremely small hitboxes combined with vanilla spread. CS spread and hitboxes work, because it's so slow.

#11 - 13.05.2013 09:33 - Jacker

The spread of the guns is already rather small for an fps game. Tbh the hitboxes aren't so small as you make them to be. You do understand that while the hitboxes are fine for the most part while the model is standing but they are bugged in many other postures? Fixin them by hardcoding is just pointles when we could just use bone data. This is rather an issue like people wanting to play 2.55 because it has bugs.

#12 - 20.11.2013 20:35 - Spyhawk

- File standing_bug.jpg added

- File standing_fixed.jpg added

- File prone_bug.jpg added

- File prone_fixed.jpg added

- File dead_bug.jpg added

- File dead_fixed.jpg added

- File swimming_bug.jpg added

Since ET:L still uses the terrible default etmain hitboxes, here is what I suggest for 2.71: implement the hardcoded "fixed" hitboxes from etpub, and do so by default (no cvar required) since these are more bugfix than a different hitboxes system. This would be only an intermediary step while the new hitboxes system is implemented later.

See the attached screenshots:

- lower the standing player's body hitbox to the shoulders.
- lower the crouching player's body hitbox to the shoulders.
- lower the wounded player's body hitbox to a reasonable height.
- lower the prone player's body hitbox to a reasonable height.

I'll try to find a way to fix the swimming hitbox too (not fixed in etpub). Also, the headboxes seem curiously accurate, although the code from g_realHead has not been implemented yet. Did I miss something here?

#13 - 20.11.2013 20:42 - Mateos

According to the screenshots, the entire bottom of the legs is still "safe", isn't it?

#14 - 20.11.2013 20:50 - Spyhawk

Yes. The etpub hitboxes aren't great, but they are still an improvement over the current situation.

#15 - 20.11.2013 20:58 - Mateos

It is possible to implement a more accurate system atm, or would the extra required work be not worth it?

Just to know, I'm not against it as this: is the system far different from the ETPro one?

#16 - 20.11.2013 21:15 - Spyhawk

As I understand it, ETPro hitboxes are similar to the etpub hitboxes above but with some work done on the antilag side (most of which has been incorporated in et:l already). See http://enemyterritorytips.wordpress.com/2008/11/22/hitboxes-in-enemy-territory-et-pro-reyaip-report/.

NQ hitboxes are much more complex, as shown here: http://www.crossfire.nu/journals/view/id/125816
This might be a too big change for 2.71 already, and the work involved might be not worth it if we want to implement a better skeleton hitbox system later.

Edit: NQ g_debugHitboxes shows default squared hitboxes like etpub/etpro, so the change above would bring legacy mod more or less on par with

etpub/etpro/nq.

#17 - 21.11.2013 22:05 - Dragonji

Spyhawk wrote:

> NQ hitboxes are much more complex, as shown here: http://www.crossfire.nu/journals/view/id/125816

This is all Jaymod, Indloon posted pics from Jaymod docs.

This is NQ: http://imageshack.us/a/img69/2272/20110804220214goldrush2.jpg

#18 - 22.11.2013 10:49 - keMoN

I have to say, I'm not a fan of changing the wounded player hitbox.
When I'm medic and want to revive someone (frequently with enemies around) I want to make that quick.
With that tiny hitbox you are most likely to miss the wounded player and since the animation of the syringe is horribly slow it takes nearly up to 2 seconds to give it another chance.

The reviving process is using the hitboxes as-well, isn't it?

#19 - 22.11.2013 20:20 - Spyhawk

Dragonji> Thx, so as I suspected it the NQ hitboxes aren't as complicated (see my edit above).

KeMon> Unless you're not even aiming at the wounded teammate, this change probably wouldn't make any difference for a medic. But it would certainly make it simpler to gib wounded players for the enemy. Double edge sword, you know.

Edit: harder→simpler

#20 - 02.02.2014 00:56 - Spyhawk

- Related to Bug #503: Fix dead player hitbox direction and bb height added

#21 - 04.02.2014 19:19 - IR4T4

- Target version changed from 2.75 to 2.71rc4

Spyhawk, can you tell us which hitbox issues are exactly fixed by your commits?

I've realized our debug vars g_debughitboxes and g_debugbullets show different hitboxes.
I think g_debugbullets still shows http://dev.etlegacy.com/attachments/download/215/standing_bug.jpg and g_debughitboxes shows http://dev.etlegacy.com/attachments/download/216/standing_fixed.jpg which is finally correct.

#22 - 04.02.2014 20:58 - Spyhawk

IR4T4> Previous commits should have changed the hitbox height of the standing, prone and dead positions (see screenshots above). The swimming box is unchanged and still buggy (similar to standing hbox), since I've not been able to have a consistent height in all situation in water. Overall, the current hitboxes should be similar to ETPub default.

I'm not sure why you get different debughitbox, might be related to antilag that I overlooked.

#23 - 04.02.2014 22:11 - IR4T4

Well ... we have no g_hitboxes cvar like etpub and we should use the ClientHitboxMaxZ adjustment for bullet/weapon related traces only (no need to do for all). Adjustments have to be done before the trapTrace call and in case you set the r.maxs[2] value on real game ents it should be undone after.

Edit: if you enable both cvars g_debugbullets 3 and g_debughitboxes 1 you'll notice the difference in both debug views.

#24 - 16.02.2014 19:11 - Spyhawk

- Tracker changed from Task to Feature

- Target version changed from 2.71rc4 to 2.78

#25 - 22.11.2014 12:11 - Spyhawk

- Related to Feature #662: Introduce ragdoll effect added

#26 - 16.12.2014 21:12 - IR4T4

- Status changed from New to Feedback

- Target version changed from 2.78 to 2.71

- % Done changed from 0 to 80

#27 - 17.12.2014 00:56 - Saukko

Head hitbox seems very random to me. I can take a demo footage of it. I just doubt it would be spread causing such unreliability. I actually can finally finish my enemy with headshots when he is on the ground. Significant improvement to the better. Going to try a bit more later on to see some more.

-*S

#28 - 17.12.2014 00:59 - Spyhawk

Players now have unlimited helmets (helmet pops up, but another reappears on the model). The responsible commit seems to be 39d296a3c62e26d3b2576efec63c4db679a6260a

#29 - 17.12.2014 13:06 - Jacker

Spyhawk wrote:

> Players now have unlimited helmets (helmet pops up, but another reappears on the model). The responsible commit seems to be 39d296a3c62e26d3b2576efec63c4db679a6260a

Fixed!

#30 - 18.12.2014 17:10 - Spyhawk

- Related to Bug #735: Player model is shaking added

#31 - 21.12.2014 13:41 - IR4T4

- Target version changed from 2.71 to 2.78

#32 - 24.07.2015 12:17 - Jacker

- Status changed from Feedback to Fixed

- % Done changed from 80 to 100

#33 - 24.07.2015 12:51 - IR4T4

- Target version changed from 2.78 to 2.74

#34 - 05.09.2016 15:17 - Spyhawk

- Category changed from General to Mod generic

- Status changed from Fixed to New

- Assignee deleted (Jacker)

- Target version changed from 2.74 to 2.76

- % Done changed from 100 to 50

We should have another look at this, as Jaymod (now open sourced) implements hitboxes based on skeleton animation.

#35 - 16.01.2017 20:13 - IR4T4

- Target version changed from 2.76 to 2.78

#36 - 18.01.2019 14:49 - Spyhawk

- Related to Feature #1174: Increase slightly the height of wounded player's hitbox added

#37 - 27.01.2019 20:19 - Spyhawk

- adjust cg_debugplayerHitboxes so it display the same hitboxes as predicted client side (doesn't take ZMax into account atm)
- use better colors for cg_debugplayerHitboxes (blue in hardly visible)
- adjust g_debugPlayerHitboxes so it displays the legs hitbox server side too
- adjust cg_debugplayerHitboxes so it displays headbox in all position on the client side
- check if dead players have a legs hitbox (like prone) or if it is missing.

Check hit regions and how the related to the current hitbox system.

#38 - 28.01.2019 21:01 - Spyhawk

- Target version changed from 2.78 to 2.77

Moving to 2.77 for the hitbox debug code.

#39 - 21.02.2019 18:45 - Spyhawk

- Related to Bug #1209: Region hits don't take non headshot weapon into account added

Files

standing_bug.jpg	161 KB	20.11.2013	Spyhawk
standing_fixed.jpg	148 KB	20.11.2013	Spyhawk
prone_bug.jpg	158 KB	20.11.2013	Spyhawk
prone_fixed.jpg	173 KB	20.11.2013	Spyhawk
dead_bug.jpg	166 KB	20.11.2013	Spyhawk
dead_fixed.jpg	137 KB	20.11.2013	Spyhawk
swimming_bug.jpg	142 KB	20.11.2013	Spyhawk